WHAT IS CLAIMED IS:

1. A matching network that can be coupled between an ac power source and a load to reduce ac energy reflected from said load, said matching network comprising:

(a) a first transmission line that can be coupled to said ac power source; and

(b) a second transmission line inductively coupled to said first transmission line, wherein said first and second transmission lines are inductively coupled for an inductive length, said inductive length being at least one wavelength of ac energy supplied by said ac power source, wherein said second transmission line can be coupled to said load to deliver ac energy from said first transmission line to said load.

2. The matching network of claim 1 wherein said inductive length is at least 0.75 meters.

3. The matching network of claim 1 further comprising:

(c) a trimming element coupled to said first transmission line and coupled to ground.

4. The matching network of claim 1 wherein said first and second transmission lines within said inductive length are a constant fixed distance apart.

5. The matching network of claim 1 wherein said first and second transmission lines within said inductive length are positioned at a non-zero angle with respect to one another.

6. The matching network of claim 5 wherein said first and second transmission lines each have a first and second end within said inductive length, and from said first end to said second end of said first and second transmission lines the distance between the transmission lines increases.

7. The matching network of claim 1 wherein said first transmission line is comprised of a first plurality of coils, said second transmission is comprised of a second plurality of coils, and said first plurality of coils surround said second plurality of coils.

8. The matching network of claim 7 wherein said first plurality of coil have a constant radius of curvature, said second plurality of coils have a first end and a second end, and said second plurality of coils have a changing radius of curvature from said first end to said second end.

9. A method for minimizing reflected ac power from a plasma formed in a substrate processing chamber, said method comprising:

coupling an ac power source generating ac energy of a specified wavelength to said plasma in said substrate processing chamber;

coupling a matching network between said ac power source and said plasma, said matching network comprising a first transmission line and a second transmission line, wherein said first and second transmission lines are inductively coupled over an inductive length, said inductive length being at least one of said specified wavelength.

10. The method of claim 9 wherein said first transmission line receives ac energy from said ac power source, said second transmission line inductively receives ac energy from said first transmission line, and said second transmission line delivers ac energy to said plasma.

11. The method of claim 9 wherein said first and second transmission lines within said inductive length are parallel.

12. The method of claim 9 wherein, said first and second transmission lines within said inductive length have a non-zero angle with respect to one another.

13. The method of claim 9 wherein said first transmission line is comprised of a first plurality of coils, said second transmission is comprised of a second plurality of coils, and said first plurality of coils surround said second plurality of coils.

14. A method for minimizing reflected ac power from a plasma formed in a substrate processing chamber, said method comprising:

generating an ac power signal having a specified wavelength and transmitting said signal to a first transmission line that is inductively coupled to a second transmission line over an inductive length, wherein said inductive length is at least one of said specified wavelength;

transmitting said ac power signal from said second transmission line to a substrate processing chamber.

15. The method of claim 14 wherein said ac power signal has a frequency range of operation between 100 KHz to 2.45 GHz and said inductive length is between 3000 and 0.12 meters.

16. The method of claim 14 wherein said ac power signal has a frequency between 350 KHz and 400 MHz and said inductive length is between 857 meters and 0.75 meters.

17. An energy delivery system comprising:

an ac power source capable of generating an ac signal of at least 100 KHz;

a matching network having a first transmission line that can be coupled to said ac power source, a second transmission line inductively coupled to said first transmission line, wherein said first and second transmission lines are inductively coupled for an inductive length, said inductive length being at least 0.75 meters; and

a load coupled to said second transmission line.

18. The matching network of claim 17 wherein said ac power source is an RF generator and said load is a plasma.

19. A substrate processing system comprising:

(a) an RF generator;

(b) a substrate processing chamber; and

(c) a matching network having a first and second transmission line, said first transmission line being coupled to said RF generator; said second transmission line being coupled to said substrate processing chamber, where said first and second transmission lines are inductively coupled over an inductive length.